Patch P426_APO_A100063

Release Notes

Distribution of Centrally Collected Radar Products on the SBN

May 24, 2000

1.0 Overview

To support the central collection and distribution of radar products via the SBN at the NCF, a capability was implemented in AWIPS to include a *national* set of products to a site's adaptable Routine Product Request (RPS) list and to forward the new collective to the specified radar(s). Incoming products received by AWIPS and identified for central collection are distributed to the NCF via the AWIPS WAN.

The national set of products include all radar products currently collected by the NIDS vendors from all WSR-88D radars, commonly known as the NIDS products, Archive Level III products, and any others identified for national collection.

This capability is evident whenever an RPS list is sent to the radar, specifically in AWIPS's response to the receipt of a General Status Message (GSM) from the radar and in response to a transmission request of a new RPS list from a forecaster via the RPS List Editor.

2.0 National Product Set

The national set of products to be incorporated into the collective RPS sent to the radar, varies by the communication line type to the radar (56 Kbps, 33.6 Kbps, 14.4 Kbps)[1] and the radar's weather operational mode (clear-air or storm)[2]. Thus, the national set of radar products is distributed among 4 files located in the /data/fxa/nationalData directory. These files include the following:

- **S** rps-RPGOP.clear-air
- **S** rps-RPGOP.storm
- **S** rps-assoc.clear-air
- **S** rps-assoc.storm

Tables 2.1-2.4 display the contents of the national radar files.[3]

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[1] The Radar Product Generator (RPG) supports and distributes radar products to multiple users, including AWIPS. The connection line type to an AWIPS user is normally configured at the RPG either as an RPGOP Class I or as an associated Class I line type. A maximum of 50 products may be requested by an RPGOP Class I user (typically via a 56 Kbps communications line); 31 products by an associated Class I user (typically via a 14.4.Kbps communications line).

[2] There is no national set of radar products corresponding to a maintenance weather operational mode.

[3] The 4 national radar files were created using the RPS List Editor and therefore, appear in the standard file format used by the RPS List Editor.

Table 2.1. rps-RPGOP.clear-air

RPS List rps-RPGOP.clear-air created 2000:02:16:18:21:23 ... 21 products
An RPS list contains the following fields: Product Name, Product Mnemonic, Product Code, Number of Data Levels, Resolution, Layer Code, Elevation, Contour Interval, Priority, Req Interval, and Map
The record format is: '%-39s %-3s%4d%4d%6d %c%6d%7d%2d%2d%c'

Reflectivity (Z)	Z	19	16	100 -	5	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	15	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	25	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	35	-1 0 1N
Reflectivity (Z)	Z	20	16	200 -	5	-1 0 1N
Velocity (V)	V	25	16	25 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	15	-1 0 1N
Velocity (V)	V	27	16	100 -	25	-1 0 1N
Velocity (V)	V	27	16	100 -	35	-1 0 1N
Spectrum Width (SW)	SW	28	8	25 -	5	-1 0 1N
Spectrum Width (SW)	SW	30	8	100 -	5	-1 0 1N
Composite Ref (CZ)	CZ	37	16	100 -	-1	-1 0 1N
Composite Ref (CZ)	CZ	36	8	400 -	-1	-1 0 1N
Composite Ref (CZ)	CZ	38	16	400 -	-1	-1 0 1N
Lyr Comp Ref Max (LRM) Level 1	LRM	65	16	0 L	-1	-1 0 1N
Lyr Comp Ref MAX (APR)	APR	67	16	0 L	-1	-1 0 1N
One Hour Precip (OHP)	OHP	78	16	0 -	-1	-1 0 1N
Three Hour Precip (THP)	THP	79	16	0 -	-1	-1 0 1N
Storm Total Precip (STP)	STP	80	16	0 -	-1	-1 0 1N
VAD Wind Profile (VWP)	VWP	48	0	0 -	-1	-1 0 1N

Table 2.2. rps-RPGOP.storm

RPS List rps-RPGOP.storm created 2000:02:16:18:21:23 ... 34 products
An RPS list contains the following fields: Product Name, Product Mnemonic, Product Code, Number of Data Levels, Resolution, Layer Code, Elevation, Contour Interval, Priority, Req Interval, and Map
The record format is: '%-39s %-3s%4d%4d%6d %c%6d%7d%2d%2d%c'

Reflectivity (Z)	Z	19	16	100 -	5	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	15	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	25	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	35	-1 0 1N
Reflectivity (Z)	Z	20	16	200 -	5	-1 0 1N
Velocity (V)	V	25	16	25 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	15	-1 0 1N
Velocity (V)	V	27	16	100 -	25	-1 0 1N
Velocity (V)	V	27	16	100 -	35	-1 0 1N
Spectrum Width (SW)	SW	28	8	25 -	5	-1 0 1N
Spectrum Width (SW)	SW	30	8	100 -	5	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	5	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	15	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	25	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	35	-1 0 1N
Composite Ref (CZ)	CZ	37	16	100 -	-1	-1 0 1N
Composite Ref (CZ)	CZ	38	16	400 -	-1	-1 0 1N

Lyr Comp Ref Max (LRM) Level 1	LRM	65	16	0 L	-1	-1 0 1N
Lyr Comp Ref Max (LRM) Level 2	LRM	66	16	0 M	-1	-1 0 1N
Lyr Comp Ref Max (LRM) Level 3	LRM	90	16	0 H	-1	-1 0 1N
Lyr Comp Ref MAX (APR)	APR	67	16	0 L	-1	-1 0 1N
Echo Tops (ET)	ET	41	16	0 -	-1	-1 0 1N
Severe Wx Prob (SWP)	SWP	47	0	0 -	-1	-1 0 1N
Vert Integ Liq (VIL)	VIL	57	16	0 -	-1	-1 0 1N
Storm Track (STI)	STI	58	0	0 -	-1	-1 0 1N
Hail Index (HI)	HI	59	0	0 -	-1	-1 0 1N
Mesocyclone (M)	M	60	0	0 -	-1	-1 0 1N
Tornadic Vortex Sig (TVS)	TVS	61	0	0 -	-1	-1 0 1N
Storm Structure (SS)	SS	62	0	0 -	-1	-1 0 1N
One Hour Precip (OHP)	OHP	78	16	0 -	-1	-1 0 1N
Three Hour Precip (THP)	THP	79	16	0 -	-1	-1 0 1N
Storm Total Precip (STP)	STP	80	16	0 -	-1	-1 0 1N
VAD Wind Profile (VWP)	VWP	48	0	0 -	-1	-1 0 1N

Table 2.3. rps-RPGOP.clear-air

RPS List rps-assoc.clear-air created 2000:02:16:18:21:23 ... 17 products
An RPS list contains the following fields: Product Name, Product Mnemonic, Product Code, Number of Data Levels, Resolution, Layer Code, Elevation, Contour Interval, Priority, Req Interval, and Map
The record format is: '%-39s %-3s%4d%4d%6d %c%6d%7d%2d%2d%c'

Reflectivity (Z)	Z	19	16	100 -	5	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	15	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	25	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	35	-1 0 1N
Reflectivity (Z)	Z	20	16	200 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	15	-1 0 1N
Velocity (V)	V	27	16	100 -	25	-1 0 1N
Velocity (V)	V	27	16	100 -	35	-1 0 1N
Composite Ref (CZ)	CZ	38	16	400 -	-1	-1 0 1N
Composite Ref (CZ)	CZ	36	8	400 -	-1	-1 0 1N
Lyr Comp Ref Max (LRM) Level 1	LRM	65	16	0 L	-1	-1 0 1N
Lyr Comp Ref MAX (APR)	APR	67	16	0 L	-1	-1 0 1N
One Hour Precip (OHP)	OHP	78	16	0 -	-1	-1 0 1N
Three Hour Precip (THP)	THP	79	16	0 -	-1	-1 0 1N
Storm Total Precip (STP)	STP	80	16	0 -	-1	-1 0 1N
VAD Wind Profile (VWP)	VWP	48	0	0 -	-1	-1 0 1N

Table 2.4. rps-assoc.storm

RPS List rps-assoc.storm created 2000:02:16:18:21:23 ... 24 products
An RPS list contains the following fields: Product Name, Product Mnemonic, Product Code, Number of Data Levels, Resolution, Layer Code, Elevation, Contour Interval, Priority, Req Interval, and Map
The record format is: '%-39s %-3s%4d%4d%6d %c%6d%7d%2d%2d%c'

Reflectivity (Z)	Z	19	16	100 -	5	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	15	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	25	-1 0 1N
Reflectivity (Z)	Z	19	16	100 -	35	-1 0 1N
Reflectivity (Z)	Z	20	16	200 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	5	-1 0 1N
Velocity (V)	V	27	16	100 -	15	-1 0 1N
Velocity (V)	V	27	16	100 -	25	-1 0 1N
Velocity (V)	V	27	16	100 -	35	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	5	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	15	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	25	-1 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	35	-1 0 1N
Composite Ref (CZ)	CZ	38	16	400 -	-1	-1 0 1N
Lyr Comp Ref Max (LRM) Level 1	LRM	65	16	0 L	-1	-1 0 1N
Lyr Comp Ref Max (LRM) Level 2	LRM	66	16	0 M	-1	-1 0 1N
Lyr Comp Ref Max (LRM) Level 3	LRM	90	16	0 H	-1	-1 0 1N
Lyr Comp Ref MAX (APR)	APR	67	16	0 L	-1	-1 0 1N
Echo Tops (ET)	ET	41	16	0 -	-1	-1 0 1N
Vert Integ Liq (VIL)	VIL	57	16	0 -	-1	-1 0 1N
One Hour Precip (OHP)	OHP	78	16	0 -	-1	-1 0 1N
Three Hour Precip (THP)	THP	79	16	0 -	-1	-1 0 1N
Storm Total Precip (STP)	STP	80	16	0 -	-1	-1 0 1N
VAD Wind Profile (VWP)	VWP	48	0	0 -	-1	-1 0 1N

The national products sets contained in rps-RPGOP.clear-air and rps-RPGOP.storm include the NIDS and Archive Level III products and apply to all NWS and FAA radars supporting either a 56 Kbps or 33.6 Kbps connection; the national product sets which apply to DOD radars, however, are limited to the NIDS products due to the smaller connection line speed (14.4 Kbps).

3.0 Receipt of a General Status Message

A. Description of Baseline Functionality

When a General Status Message (GSM) is received by AWIPS via the RadarServer process, the message is decoded for the radar's most recent operational mode and volume coverage pattern. If the extracted mode has changed from its current mode (as shown in the /data/fxa/workFiles/wfoApi.StateInfo file), a new RPS list, comprising of products retrieved from the appropriate default mode file[4], is sent to the radar. If the mode has not changed and if the GSM has indicated that the radar has not issued a commanded disconnect, the current RPS list is sent.

[4] There are 3 default mode files for each site's associated radar: KXXX.maint, KXXX.clear-air, and KXXX.storm where KXXX is the radar id. These files are located in the /data/fxa/radar/lists directory.

Transmission of a new mode RPS list, however, is subject to a maximum product limitation for that connection line type. If the size of the mode RPS list exceeds the maximum product specification, then the new list is not sent and a PROBLEM message is recorded in the RadarServer log file (located on ds1 in /data/logs/fxa/<date> directory). If the size of the new mode RPS list satisfy the maximum product constraint, the current product set is replaced in memory and stored to disk (/data/fxa/radar/lists/KXXX.current).

No notification is sent to the forecaster via the workstation concerning the transmission status of the RPS list in response to a GSM.

B. Description of New Capability

AWIPS's response to the receipt of a General Status Message remains the same, that is, if the GSM indicates a radar mode change, a new mode RPS list is sent to the radar; otherwise, the current RPS list is sent.

The new mode RPS list, however, consists of products not only retrieved from the local default mode file but also of products retrieved from the national set appropriate for the radar's operational mode and connection line type.

Prior to transmission, the collective RPS is filtered for duplicates. Product dependent parameters (ex: elevation) are used as a the comparative standards by which to identify duplicates; these dependent parameters vary by product category. The resultant RPS list is a list of unique products, where the national set appears first followed by unique local products.

In keeping with the baseline behavior, the size of the collective RPS list is subsequently compared to the maximum product size for that line type. However, the baseline capability was extended to apply the commanded disconnect criteria to limit transmission of the mode RPS list.

4.0 Receipt of a New RPS Request

A. Description of Baseline Functionality

When a new RPS request is received from the forecaster (via the RPS List Editor), the request message is forwarded to the specified radar. As in the case of the General Status Message, transmission of the new RPS request is subject to the maximum product limitation imposed on the line type. If the size of the new request is within the maximum product specification, the current product set is replaced in memory and on disk. Otherwise, a PROBLEM message is logged and the current product set remains active.

In addition, a notification is sent to all workstations alerting users of the transmission status of the RPS request. The notification appears in the Radar Status Bar.

B. Description of New Capability

The capability introduced merges the national set of products with the forecaster's customized set of requested products. The collective is filtered to remove duplicates and its size is validated against the maximum product specification prior to transmission. The final collective reflects unique products where the national set is listed first.

5.0 From a User's Perspective

A. Viewing the National Radar Product Sets

The 4 national product sets may easily be viewed using the Routine Product Set (RPS) List Editor on the D-2D workstation.

Figure 5.1 shows the RPS List Editor as it appears when selected from the Applications Cascading Menu under the Radar Menu.

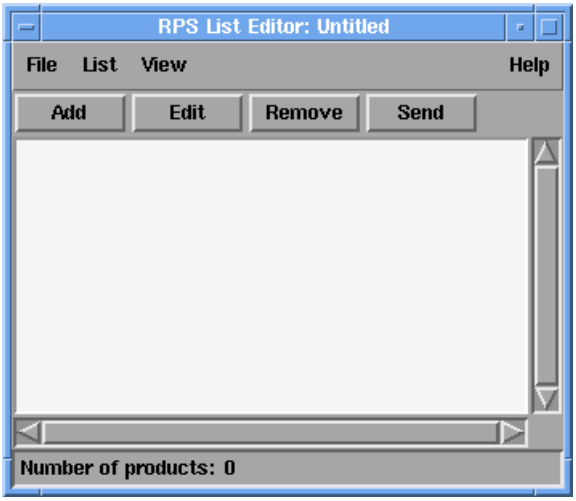

Figure 5.1. The RPS List Editor Dialog Box

Steps

- Press the *File* button from the main menu.

- Select *Open...* from the pull-down menu.

  Result: A list of files, in the /data/fxa/rps-lists directory, is displayed with default file extension of rps, as shown in Figure 5.2.

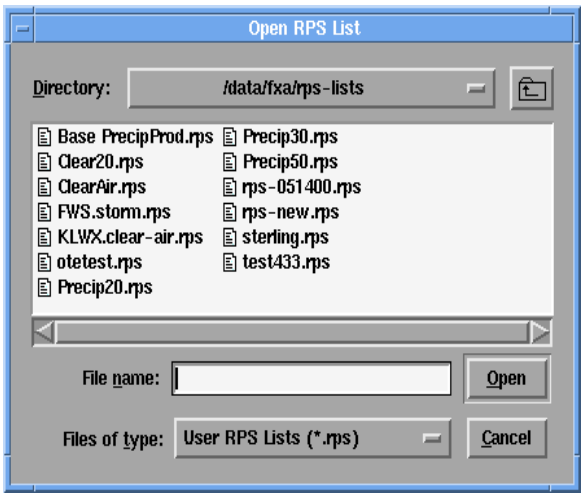

Figure 5.2. The Open RPS List Dialog Box

- Press the “go back 1 folder” icon located to the right of the *Directory* field entry.
  Result: /data/fxa appears in the *Directory* field.

- Double click on the folder named nationalData to open the /data/fxa/nationalData directory, as shown in Figure 5.3.

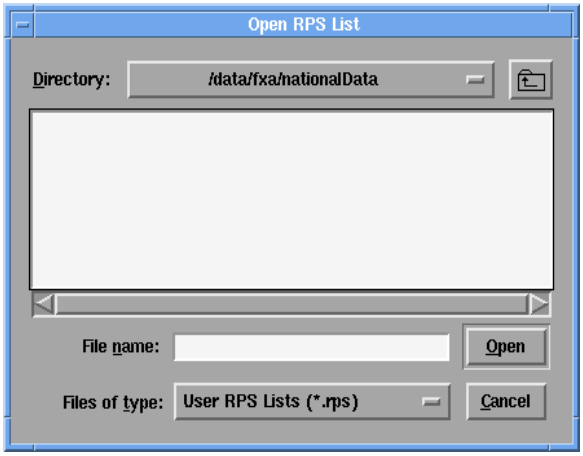

Figure 5.3. The /data/fxa/nationalData List Box.

- Press the *User Rps List (*.rps)* button to change the file types displayed.

- Select *All Files (*).*

- Using the horizontal scroll bar, locate the national data sets beginning with the rps file prefix, as shown in Figure 5.4.

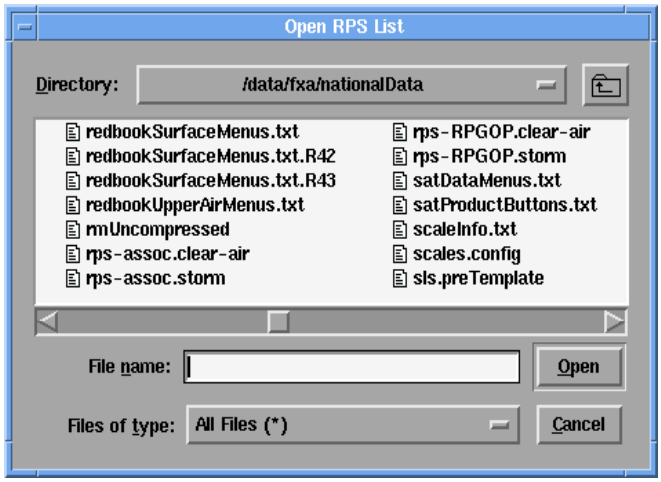

Figure 5.4. Display of the national radar product files.

- Select a national set to view by clicking on the filename to highlight and pressing the *Open* button.

Example: rps-RPGOP.storm

Figure 5.5 displays the national product set corresponding to a 56 Kbps radar connection and storm weather operational mode.

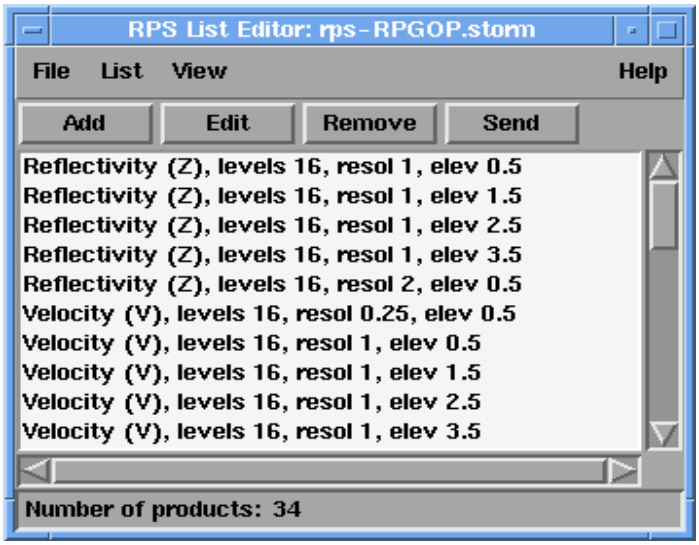

Figure 5.5. The RPGOP.storm national product set

In this manner, the 4 national radar product sets may be viewed. These files cannot be modified except by *fxa* user.[5]

[5] The RPS List Editor provided by Release 4.2.6 does not display an information box warning users that attempted changes to the national product set cannot be made; therefore, it may appear that changes can be effected to the national RPS file. However, if the file in question were reopened, the contents of the file would remain unchanged.

B. Modifying the Default Product Set

The enhanced capability is designed to use a site's default RPS lists or mode files whenever a response to the radar's mode status is required. A site generally has a set of 3 default RPS lists, one set for each dedicated associated radar and one product list for each weather operational mode (maintenance, clear-air, and storm). The default mode files (KXXX.maint, KXXX.clear-air, and KXXX.storm where KXXX is the site id) are located in the /data/fxa/radar/lists directory and can be viewed using the RPS List Editor (with the exception of the maintenance RPS list).

When a General Status Message is received indicating that the radar has switched operational modes, a new RPS list, appropriate for the new weather mode, is sent to the radar. This new RPS list, however, is a *collective* list, composed of products retrieved from the appropriate default mode RPS file as well as products retrieved from the national RPS list (appropriate for the radar line type and operational mode).

Since the national product set is a static component of the adaptable RPS list sent to the radar, any changes to the RPS list, which must be made to ensure that the size of the RPS list does not exceed the maximum threshold, must be made to the default mode sets. Although the collective RPS list is filtered prior to transmission, the size of the resultant list may still exceed the maximum product specification. Thus, the user should be aware of the number of unique products that he is limited for inclusion into a local RPS list, whether that list is contained in the default mode file or created through a customized request via the RPS List Editor.

Tables 5.1 - 5.3 display the number of products identified for national distribution and the number of products available to the forecaster by operational mode:

Table 5.1. Clear Air Radar Products by Line Type

Connection Line (Kbps)	Max. Products/Line	# National Products	# Available Products
56, 33.3	50	21	29
14.4	31	17	14

Table 5.2. Storm Radar Products by Line Type

Connection Line (Kbps)	Max. Products/Line	# National Products	# Available Products
56, 33.3	50	34	16
14.4	31	24	7

Table 5.3. Maintenance Radar Products by Line Type[6]

Connection Line (Kbps)	Max. Products/Line	# National Products	# Available Products
56, 33.3	50	0	50
14.4	31	0	31

When a forecaster is satisfied with the default mode RPS files, any changes made to the mode RPS files will become effective either at activation of the radar patch or when the next General Status Message is received.

C. Creating an RPS List

The forecaster can create or edit a list of radar products and send the list to the radar for display in the next radar volume scan using the RPS List Editor. As in the case of responding to a General Status Message, the new request is appended to the national set of products appropriate for the radar's line type and operational mode. The resultant collective is filtered to remove duplicates and sent to the radar if the list size is within the maximum product threshold. As noted in *Section B, Modifying the Default Product Set*, the forecaster should be aware of the size limitations imposed when customizing a local RPS request.

D. Viewing the Collective RPS List

If the collective RPS list is successfully sent to the radar, either upon receipt of a General Status Message or upon receipt of a new request from the forecaster, the collective list is saved to disk as /data/fxa/radar/lists/KXXX.current. The collective can be viewed using the RPS List Editor. Figure 5.6 displays a sample RPS list sent to the KLWX radar in storm mode.

[6] There is no national radar product set corresponding to a maintenance operational mode. When a radar is in TEST or MAINTENANCE mode, products will not be distributed across the AWIPS WAN.

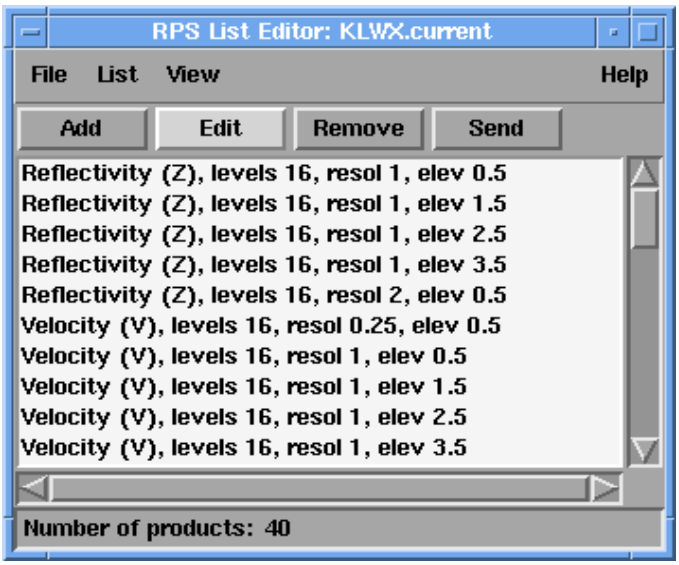

Figure 5.6. Collective RPS list Sent to KLWX in Storm Mode.

The national component appears first in the RPS collective followed by the unique local products. In this example, the connection to the KLWX radar is a 56 Kbps with a 50 maximum product transmission constraint. The national component is comprised of 34 products; the local component consists of 6 products. The basis for the collective are the two product sets shown in Table 2.2 and Table 5.4 shown below.

Table 5.4. KLWX.storm

RPS List KLWX.storm created 1998:09:29:17:53:57 ... 14 products
An RPS list contains the following fields: Product Name, Product Mnemonic, Product Code, Number of Data Levels, Resolution, Layer Code, Elevation, Contour Interval, Priority, Req Interval, and Map
The record format is: '%-39s %-3s%4d%4d%6d %c%6d%7d%2d%2d%c'

VAD Wind Profile (VWP)	VWP	48	8	0 -	-1	-1 0 1N
Echo Tops (ET)	ET	41	16	400 -	-1	-1 0 1N
Vert Integ Liq (VIL)	VIL	57	16	400 -	-1	-1 0 1N
One Hour Precip (OHP)	OHP	78	16	200 -	-1	-1 0 1N
Storm Total Precip (STP)	STP	80	16	200 -	-1	-1 0 1N
Velocity (V)	V	25	16	25 -	15	-1 0 1N
Velocity (V)	V	26	16	50 -	5	-1 0 1N
Velocity (V)	V	26	16	50 -	15	-1 0 1N
Velocity (V)	V	26	16	50 -	35	-1 0 1N
Digital Hybrid Scan (DHS)	DHS	32	256	100 -	-1	-1 0 1N
Composite Ref (CR)	CR	37	16	100 -	0	0 0 1N
Storm Rel Velocity (SRM)	SRM	56	16	100 -	24	-1 0 1N
Lyr Comp Ref Max (LRM) Level 2 Level 2	LRM	66	8	400 -	-1	-1 0 1N
Mesocyclone (M)	M	60	0	0 -	0	0 0 1N

As is evidenced from the number of products contained in the collective (40), 4 products were identified as duplicates and removed from the composite set.

6.0 Distribution of the National Set on the AWIPS WAN

Distribution of the national product set is managed by the RadarStorage process on as1, specifically via the prodList.txt configuration file (located in the /awips/fxa/data/directory) as shown in Table 6.1.

Table 6.1. The prodList.txt configuration file.

```
# productId elevAngle prodCategory Partial WMO Id
  19        5         N0R          SDUS5
  19        15        N1R          SDUS6
  19        24        N2R          SDUS6
  19        25        N2R          SDUS6
  19        34        N3R          SDUS6
  19        35        N3R          SDUS6
  20        5         N0Z          SDUS6
  25        5         N0W          SDUS6
  27        5         N0V          SDUS5
  27        15        N1V          SDUS6
  27        24        N2V          SDUS6
  27        25        N2V          SDUS6
  27        34        N3V          SDUS6
  27        35        N3V          SDUS6
  28        5         NSP          SDUS6
  30        5         NSW          SDUS6
  31        0         NUP          SDUS6
  34        0         NCF          SDUS6
  36        0         NCO          SDUS6
  37        0         NCR          SDUS5
  38        0         NCZ          SDUS6
  41        0         NET          SDUS6
  47        0         NWP          SUDS6
  48        0         NVW          SDUS6
  56        5         N0S          SDUS5
  56        15        N1S          SDUS6
  56        24        N2S          SDUS6
  56        25        N2S          SDUS6
  56        34        N3S          SDUS6
  56        35        N3S          SDUS6
  57        0         NVL          SDUS5
  58        0         NST          SDUS6
  59        0         NHI          SDUS6
  60        0         NME          SDUS6
  61        0         NTV          SDUS6
  62        0         NSS          SDUS6
  65        0         NLL          SDUS6
  66        0         NML          SDUS6
  67        0         NLA          SDUS6
  78        0         N1P          SDUS6
  79        0         N3P          SDUS6
  80        0         NTP          SDUS5
  81        0         DPA          SDUS8
  90        0         NHL          SDUS6
```

The above file contains all NIDS and Archive Level III products and any other product identified for central collection at the NCF (in both precipitation and clear-air modes). Any incoming product, received from a site's dedicated associated radar(s) and identified for national distribution (using product id and elevation angle specified in the prodList.txt file), will be distributed across the AWIPS WAN to the NCF for central collection. Additionally, only those products whose partial WMO id is SDUS5 will be additionally broadcast from the NCF to all AWIPS sites via the SBN. At the receiving site, these products may be additionally filtered.